

Draft Demand and Supply Assessment Pinal Active Management Area May 26, 2011 GUAC

Purpose of the Pinal AMA Assessment

- ▶ Compilation and study of historical water demand and supply for Pinal AMA (1985–2006)
- ▶ Calculates seven water supply and demand projection scenarios to the year 2025
- ▶ Considers the possible effect of multiple scenarios on achievement of the Pinal AMA water management goal
- ▶ An inventory of demand and supply in preparation for the Fourth Management Plan; also for use in other planning efforts (WRDC, Basin Study)

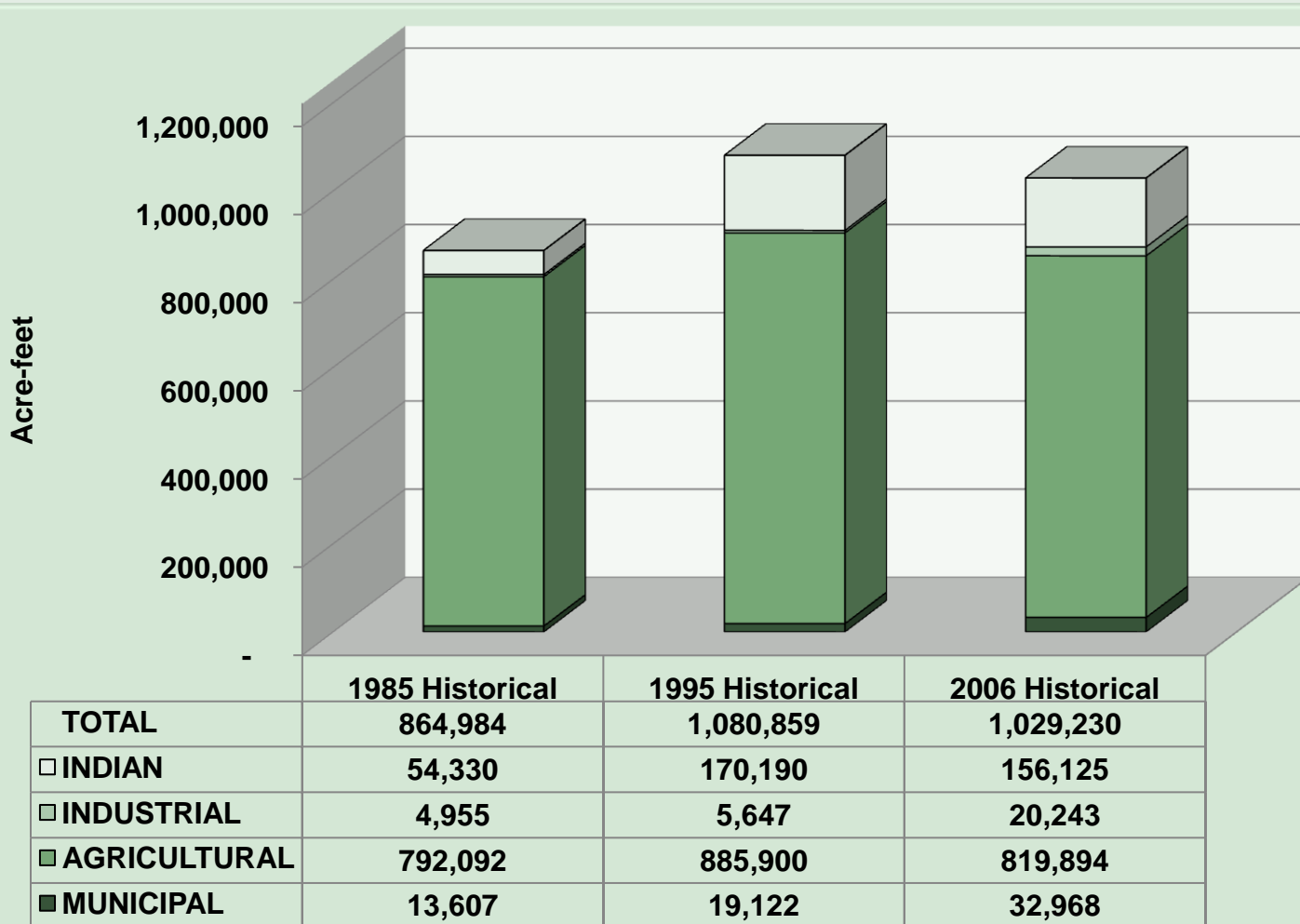
Management Goal of the Pinal AMA

- ▶ “To preserve existing agricultural economies in the AMA for as long as feasible consistent with the necessity to preserve future water supplies for non-irrigation purposes”

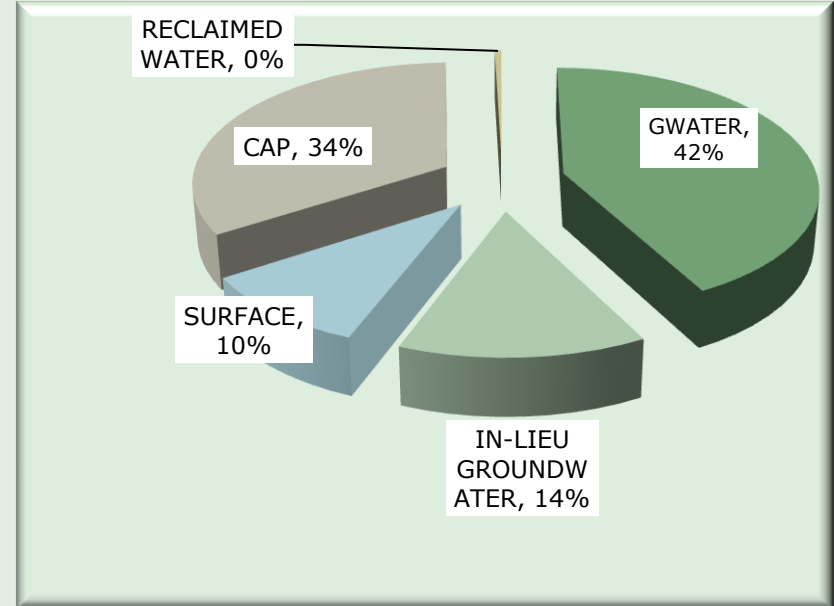
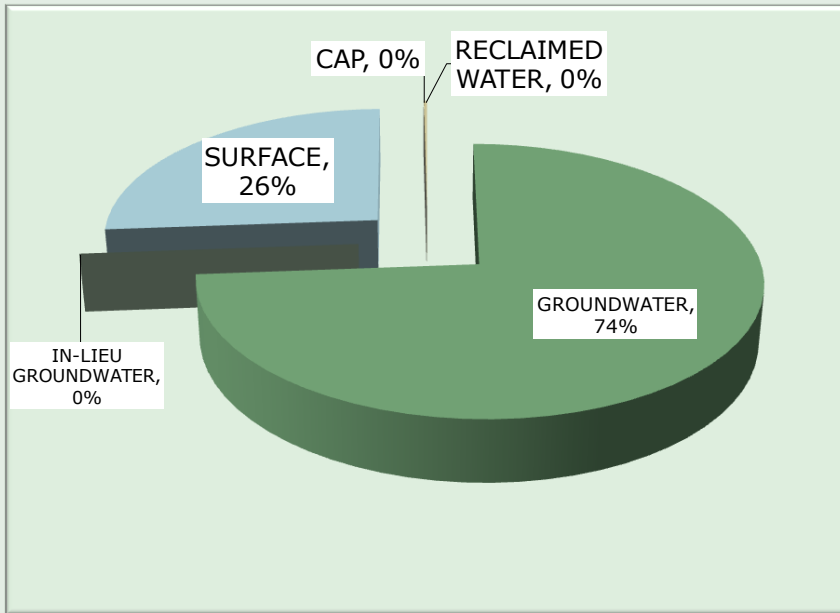
Historical Water Use

- ▶ Data was compiled from Annual Water Withdrawal and Use Reports
- ▶ Effort was made to be consistent across AMAs, sectors and years
- ▶ Historical Period is 1985–2006
 - Longest period of consecutive data (21 yrs)

Historical Sector Demand



Water Supply Used to Meet Demands



	1985	2006
Groundwater	638,607	435,453
In-Lieu Groundwater	-	139,616
Surface	224,529	102,615
CAP	-	346,741
Reclaimed	1,848	4,805
Total	864,984	1,029,230

Water Stored at Recharge Facilities

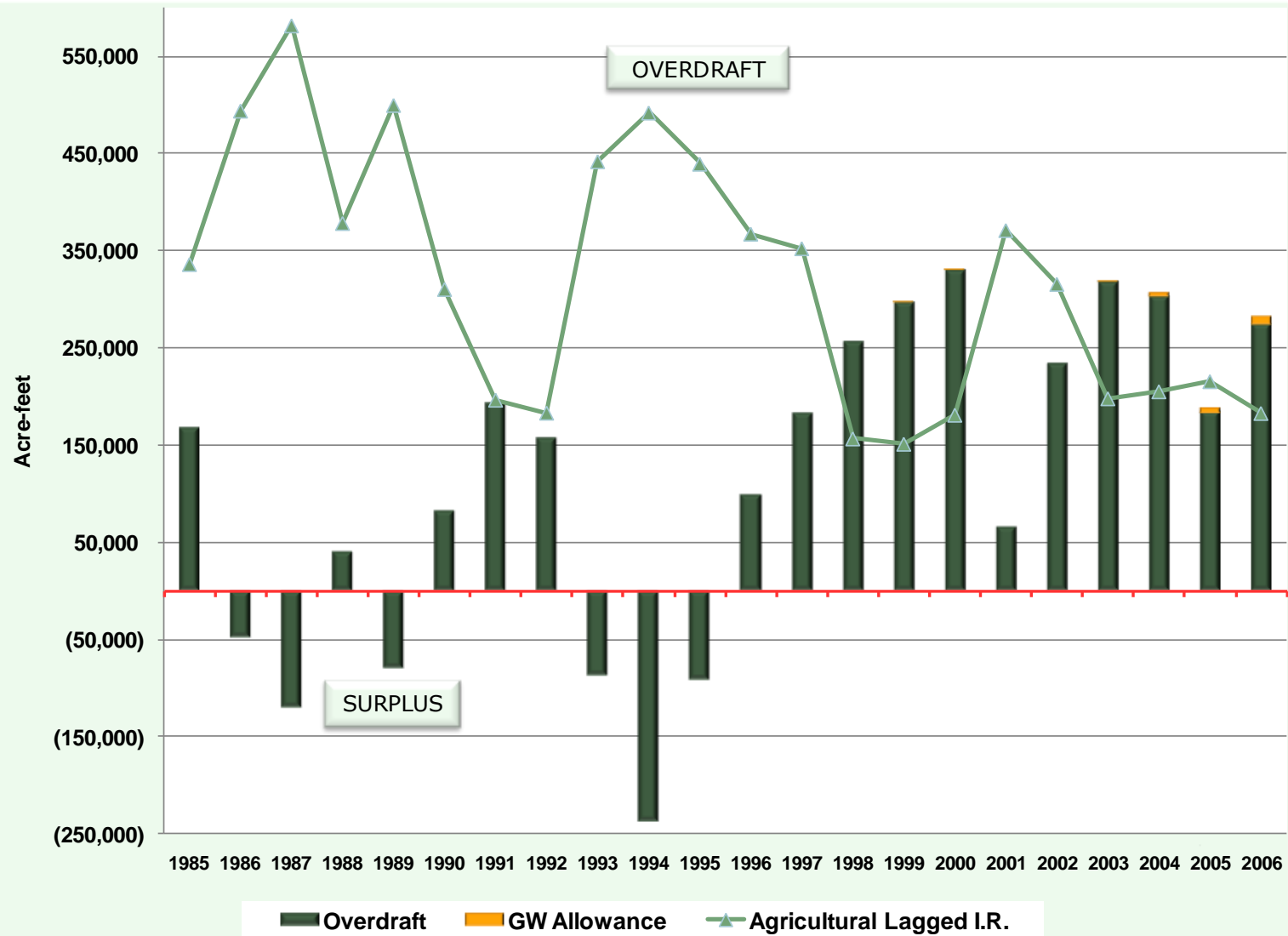
Recharge Facilities	1995	2000	2006
Groundwater Savings Facility			
<i>Number of Facilities</i>	3	3	4
<i>CAP Stored</i>	45,071	98,921	144,058
Underground Storage Facilities (Constructed)			
<i>Number of Facilities</i>	1	3	3
<i>Reclaimed Water Stored</i>	44	73	898
Total Stored	45,115	98,994	144,956

As of end of 2006, total long term credits remaining in storage was about 1.4 million acre feet, including Intra and Inter state credits (987,000 acre-feet).

Offsets to Overdraft

Offset	Historic	Projected
Sector Incidental Recharge		
<i>Municipal</i>	4% of municipal demand	
<i>Industrial</i>	12% turf, sand and gravel, and mines; other 4% 0% for dairies, power plants, feedlots	
<i>Agriculture (TMP was not lagged)</i>	From models, is lagged by 20 years; from 151k to 582k	From actual use, lagged 20 years; 226k in 2025
<i>Indian Agriculture (TMP was not lagged)</i>	Included in Agriculture until 2006	35% of demand 1985-1989; 30% of demand 1990-1994; 25% of demand 1995-2005; 22% of demand thereafter; lagged 20 years
Canal Seepage	Estimated for each year, from models	5% of non-Indian agricultural demand for non-exempt IGFRs
Net Natural Recharge (TMP used average streambed infiltration of 20,000 af)	58,300 af	Constant at 82,750; Streambed is set at 36,200 af
CAGRDR Replenishment	Begins in 2001, is 150 af in 2006	Varies year to year; 540 in Scenario Three to 1,096 in Scenario Two in 2025
Artificial Recharge Cut to the Aquifer	Based on actual numbers	Varies year to year; 679 af in Scen. One to 274 af in Scenario Three in 2025

Historical Overdraft/Surplus



Projection Methodology

► Municipal

- Population based on CAAG/PAG projections, DAWS applications, annual reports
- Projected demands based on GPCD rates, DAWS projected demands
- Projected supplies based on DAWS and historical use, capped by treatment capacity. Assumed primarily groundwater, with renewable supplies being used as necessary to meet remaining demand.

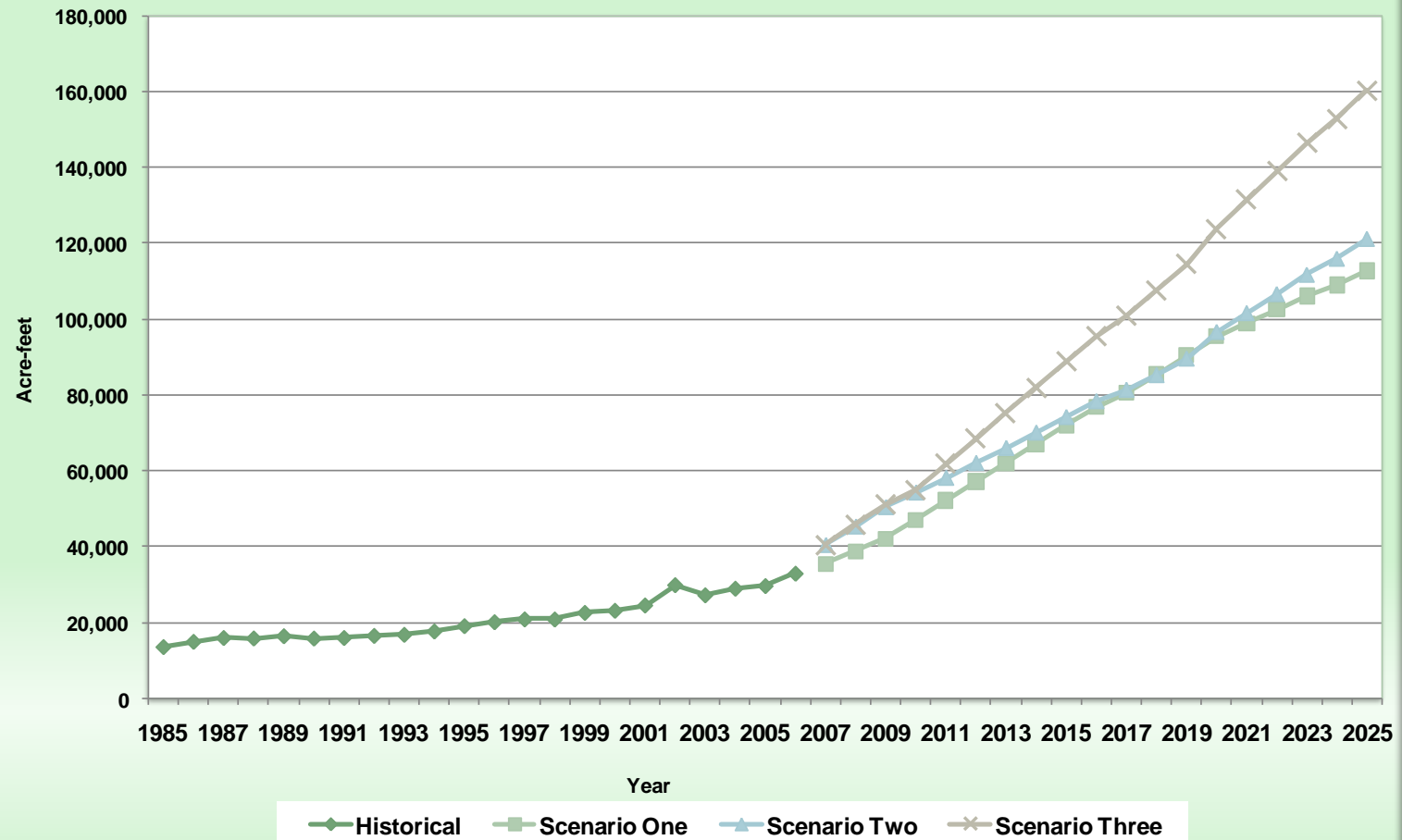
► Industrial

- Municipal population assumptions and Trend line Analysis
- AMA Staff or Sector Professional Best Judgment
- Average Historical Use or Current Use held constant
- Supplies were projected to be used in the same proportion as in 2006.

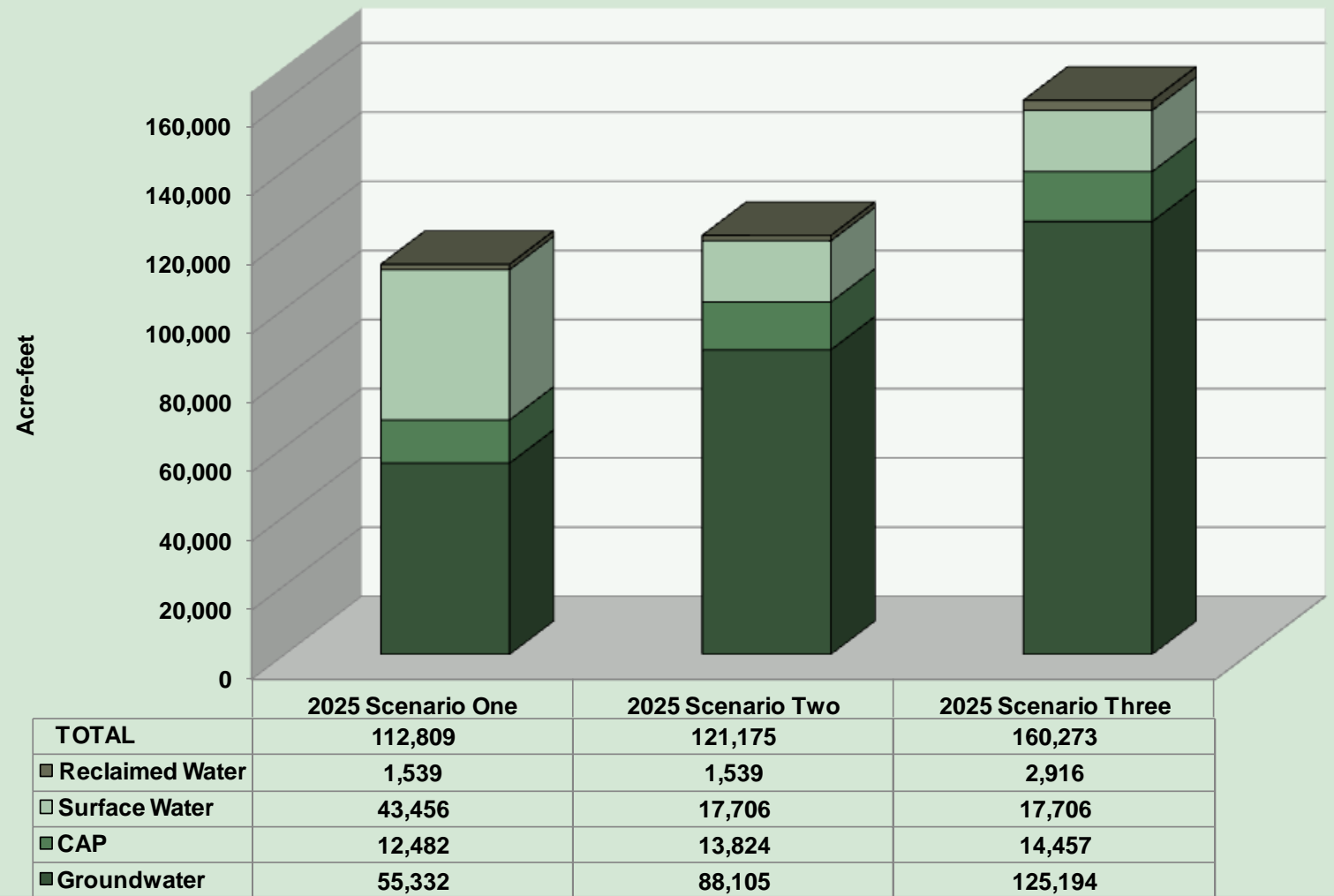
► Agriculture

- Trend line analysis of historical use, regression analysis, multiple regressions analysis and/or projections by AMA staff or sector professionals
- Average Historical Use or Current Use

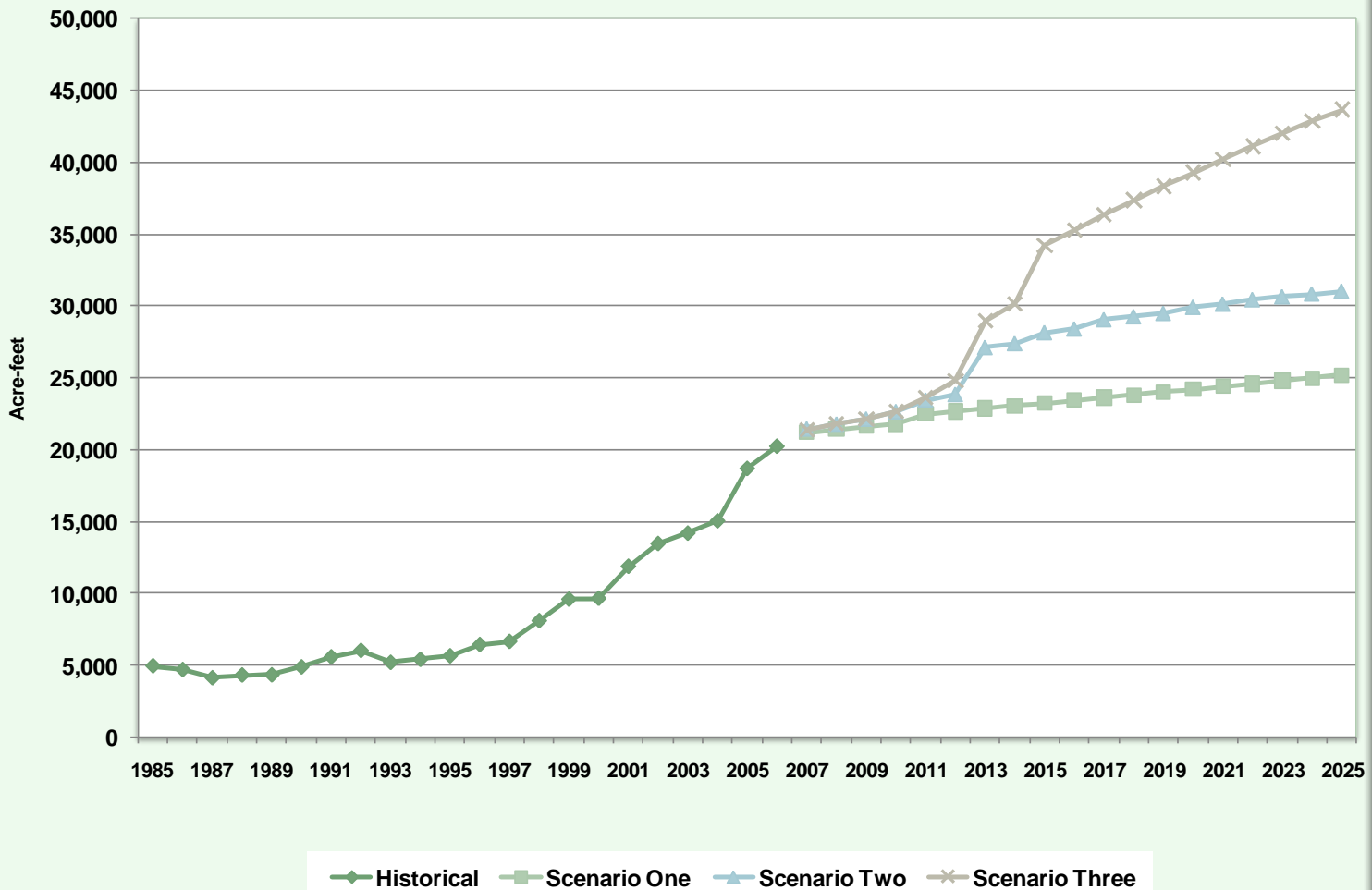
Projected Municipal Demand



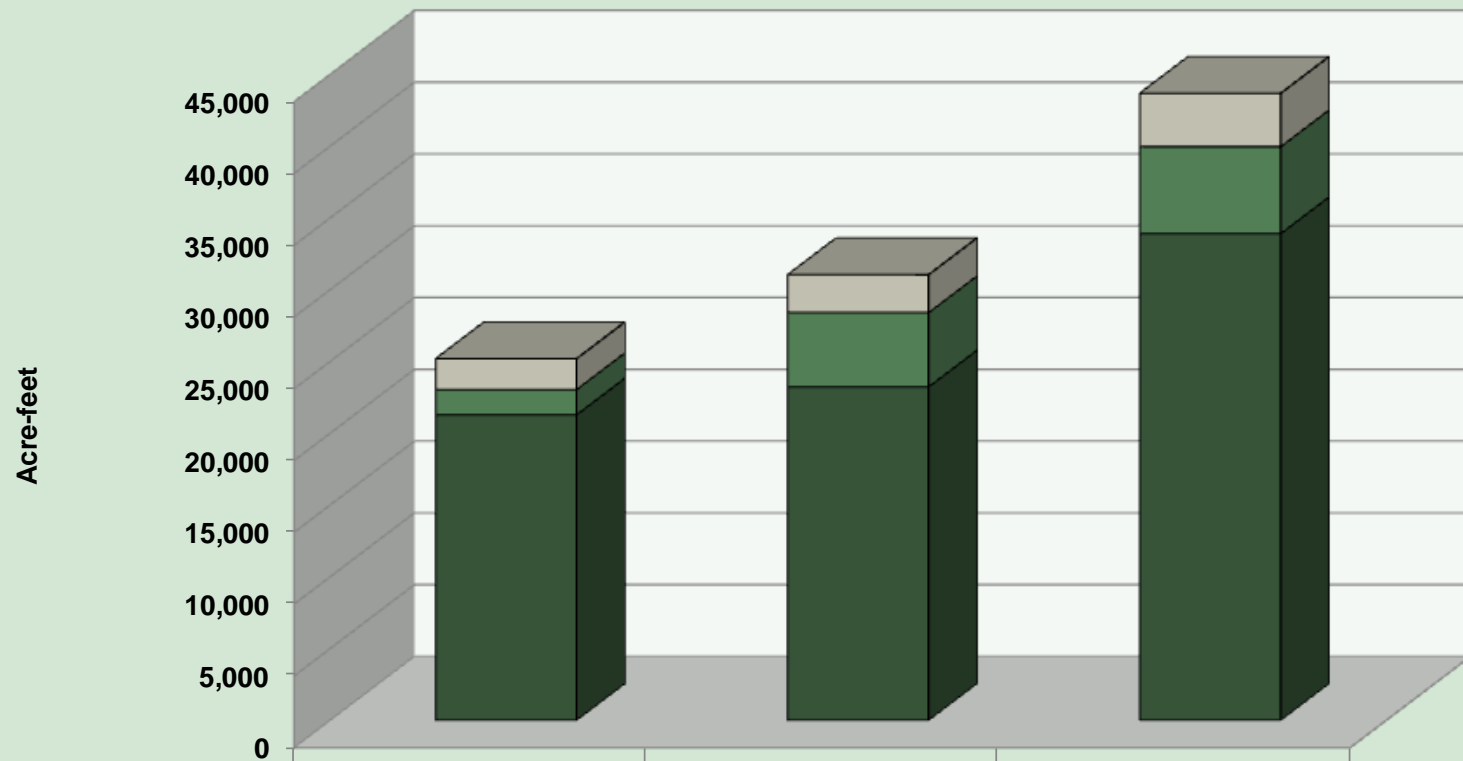
Projected Municipal Supply



Projected Industrial Demand

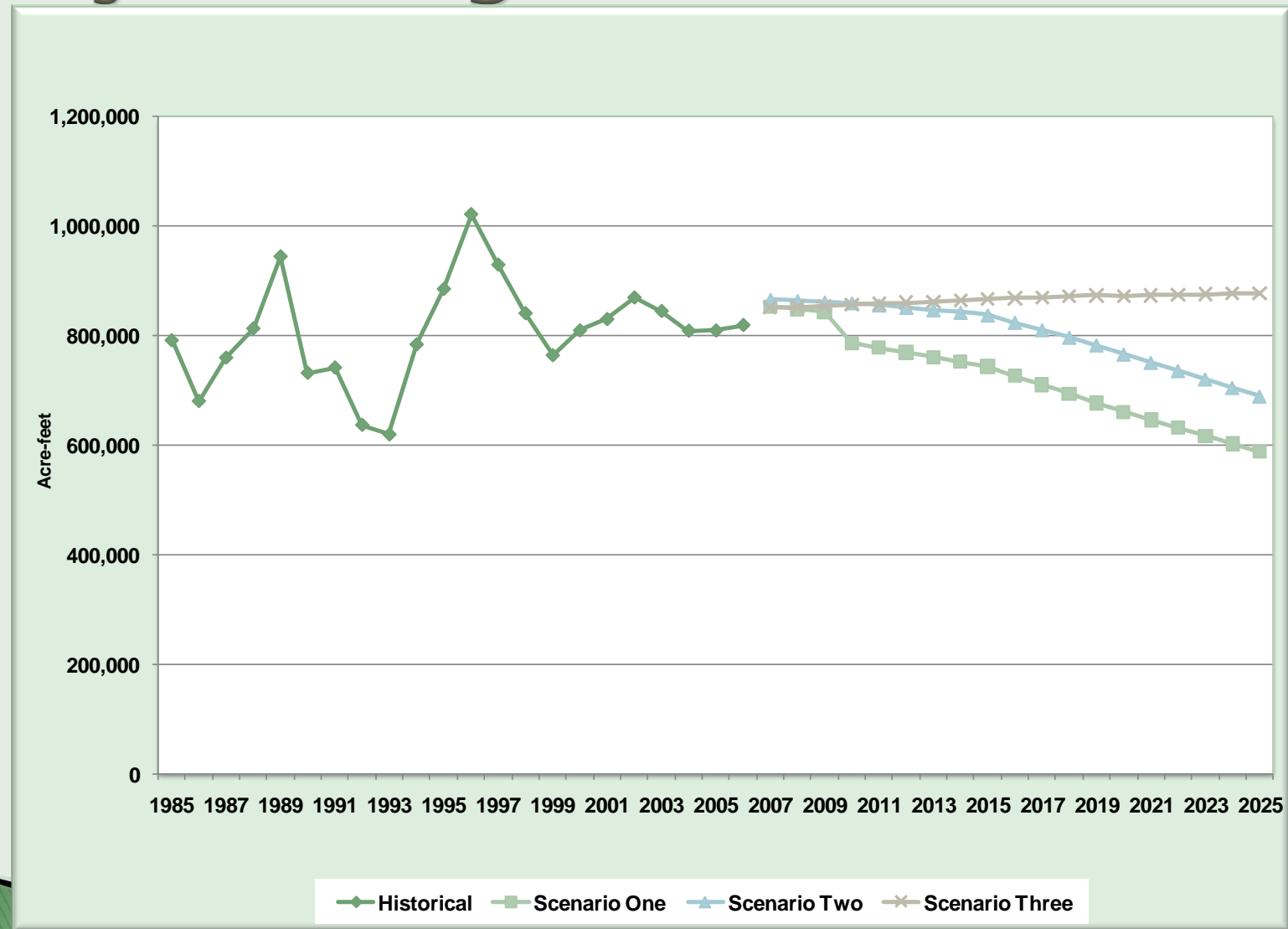


Projected Industrial Supply

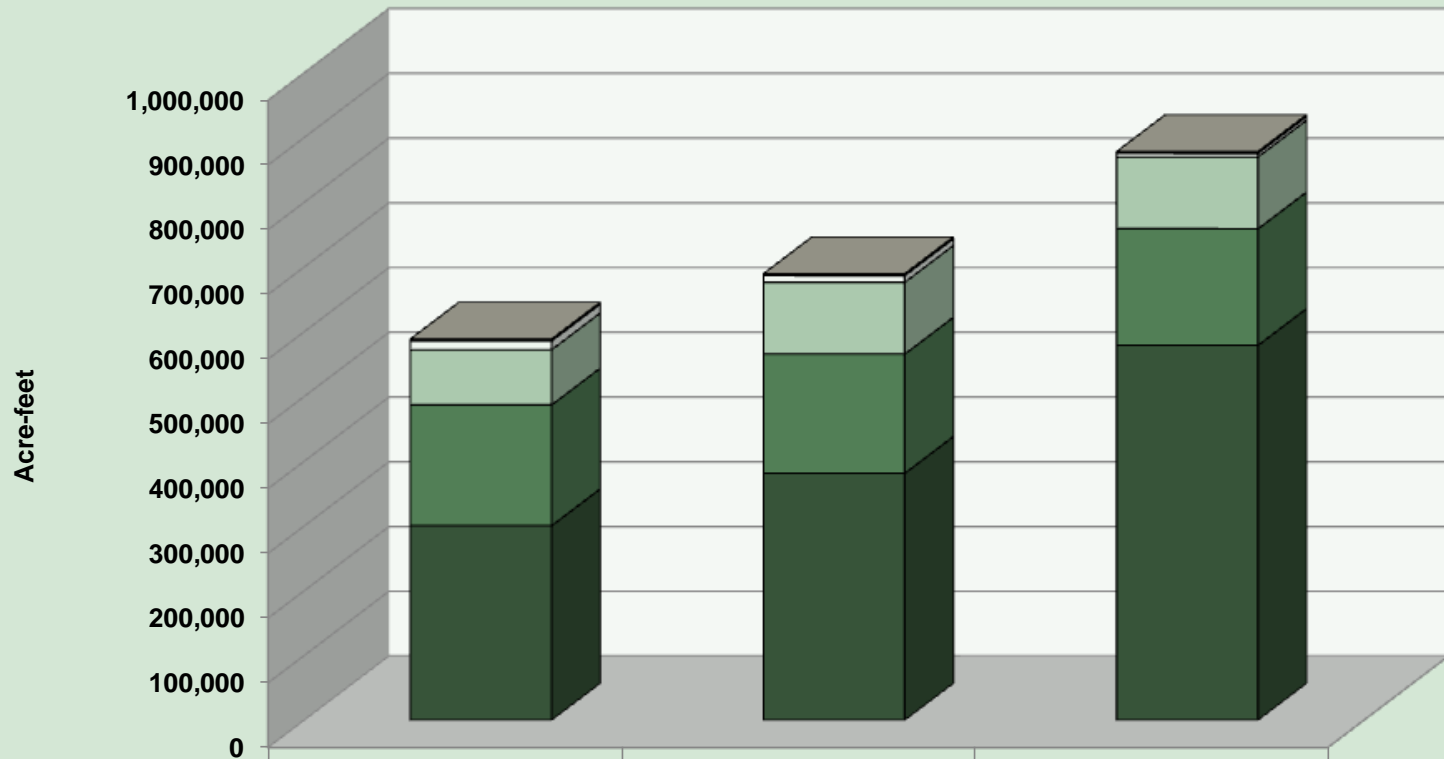


	2025 Scenario One	2025 Scenario Two	2025 Scenario Three
TOTAL	25,189	31,042	43,676
Reclaimed Water	2,141	2,639	3,712
CAP	1,763	5,173	6,057
Groundwater	21,285	23,230	33,906

Projected Agricultural Demand

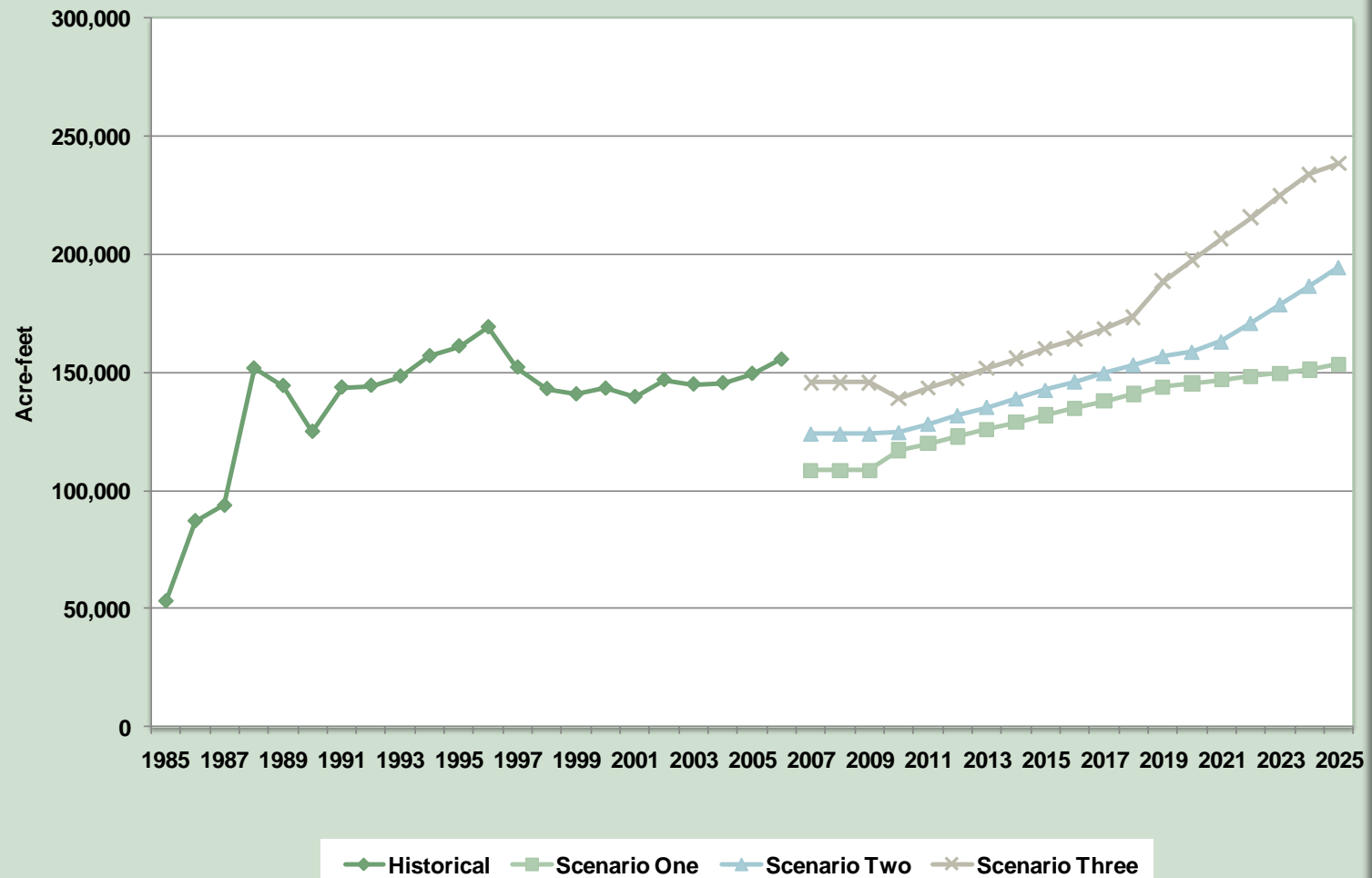


Projected Agricultural Supply

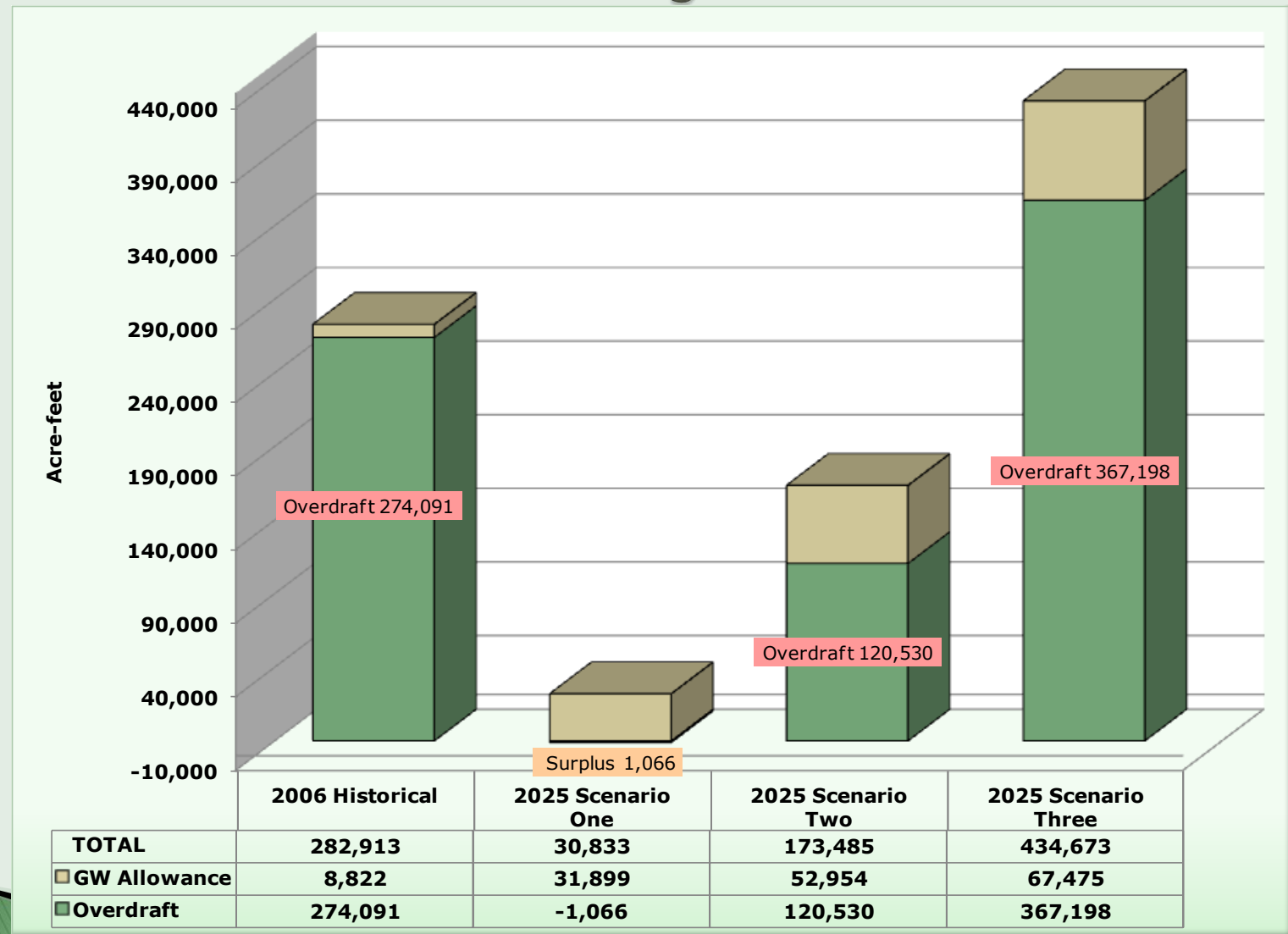


	2025 Scenario One	2025 Scenario Two	2025 Scenario Three
TOTAL	588,157	689,180	877,896
Reclaimed Water	2,500	2,500	2,500
In-Lieu Groundwater	13,572	10,313	5,475
Surface water	85,199	110,949	110,949
CAP (Direct Use)	186,554	184,147	179,995
Groundwater	300,332	381,270	578,976

Projected Indian Demand



Historical and Projected Overdraft



Additional Scenarios

▶ CAP Shortage Scenarios

- Methodology
- Shortage amounts
- Overdraft, other implications

▶ Maximized Reclaimed Water Use Scenario

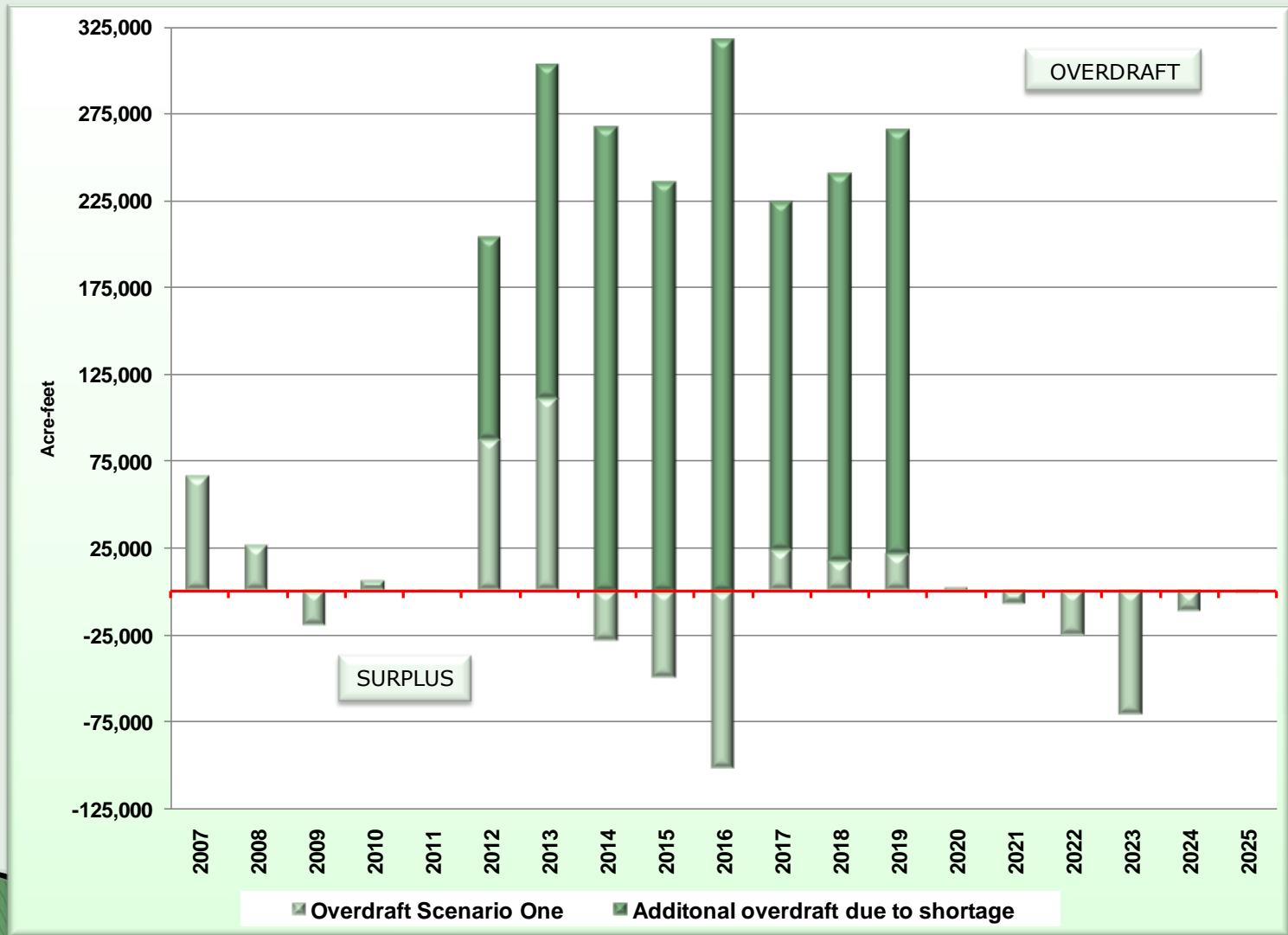
CAP Shortage Scenarios

- ▶ Three additional scenarios incorporating reduced CAP supplies in recognition of potential climate change impacts
- ▶ Demand was not altered for any of the shortage projection scenarios
- ▶ ADWR Colorado River Management (CRM) staff generated the projected CAP shortage values, based on the 100-year record of Colorado River flow.

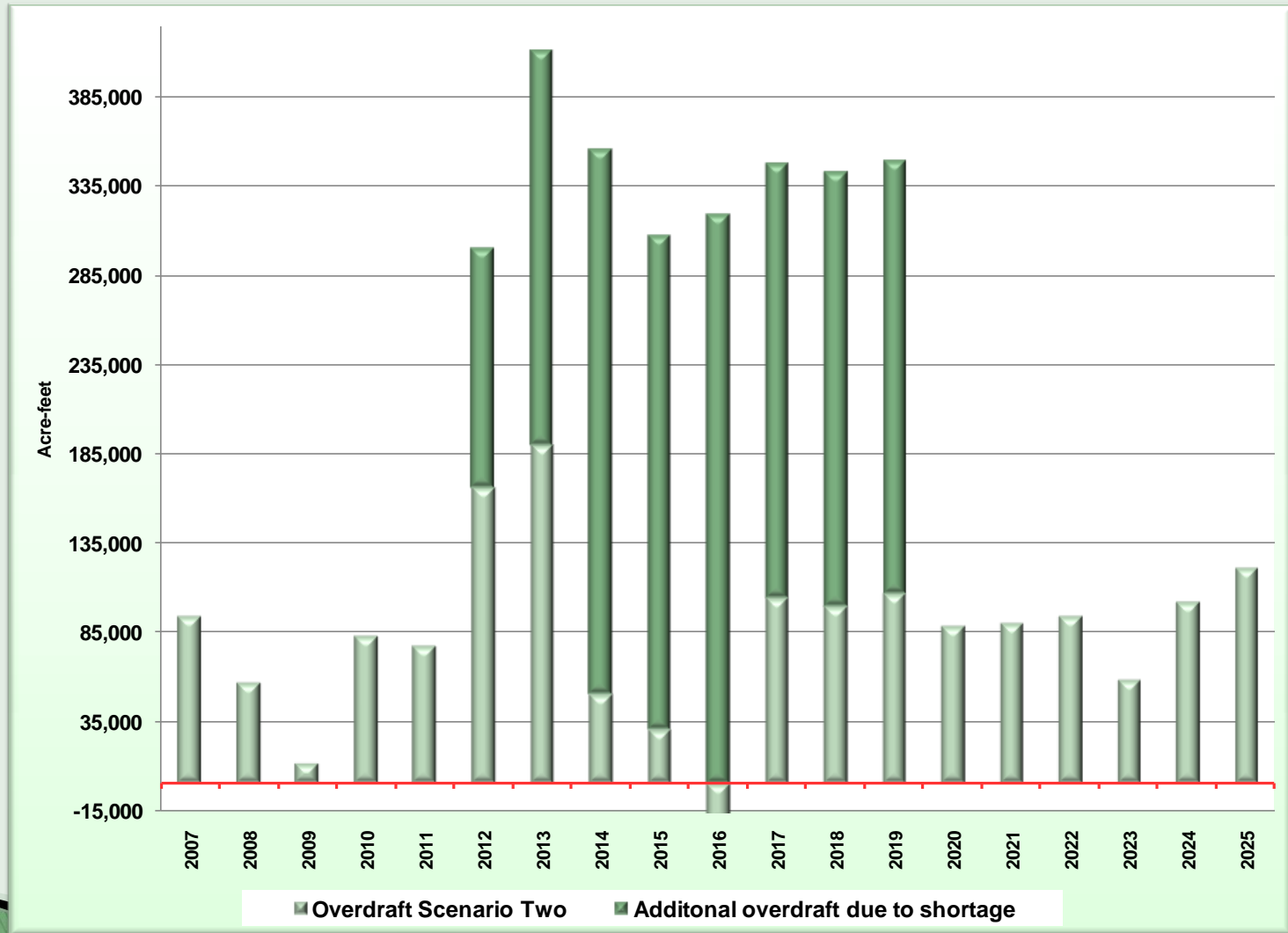
CAP shortages chosen for scenarios, shortages to Arizona and the CAP

Year	Projected CAP Availability	Shortage	Shortage Supply
2009	1,433,223	0	1,433,223
2010	1,414,442	0	1,414,442
2011	1,412,872	0	1,412,872
2012	1,411,303	320,000	1,091,305
2013	1,409,733	400,000	1,009,733
2014	1,408,164	480,000	928,473
2015	1,406,594	400,000	1,006,596
2016	1,405,025	480,000	926,753
2017	1,403,455	400,000	1,003,457
2018	1,401,885	400,000	1,001,887
2019	1,400,550	400,000	1,000,553
2020	1,399,215	0	1,399,215
2021	1,397,902	0	1,397,902
2022	1,382,590	0	1,382,590
2023	1,381,277	0	1,381,277
2024	1,379,964	0	1,379,964
2025	1,378,651	0	1,378,651
Sum of Shortage	23,826,844	3,280,000	20,546,844

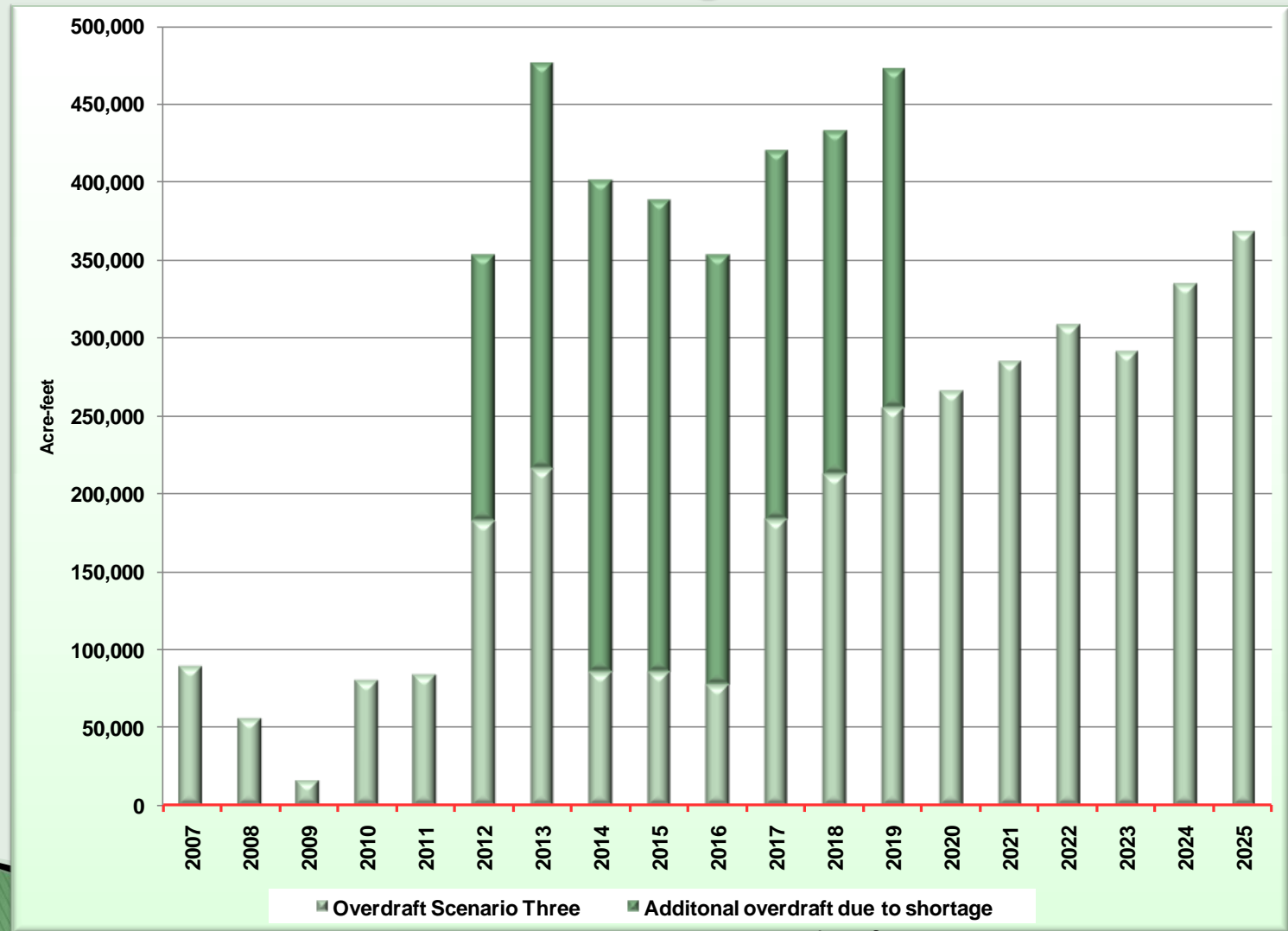
Shortage Scenario One Projected Annual Overdraft With and Without CAP Shortage



Shortage Scenario Two Projected Annual Overdraft With and Without CAP Shortage



Shortage Scenario Three Projected Annual Overdraft With and Without CAP Shortage

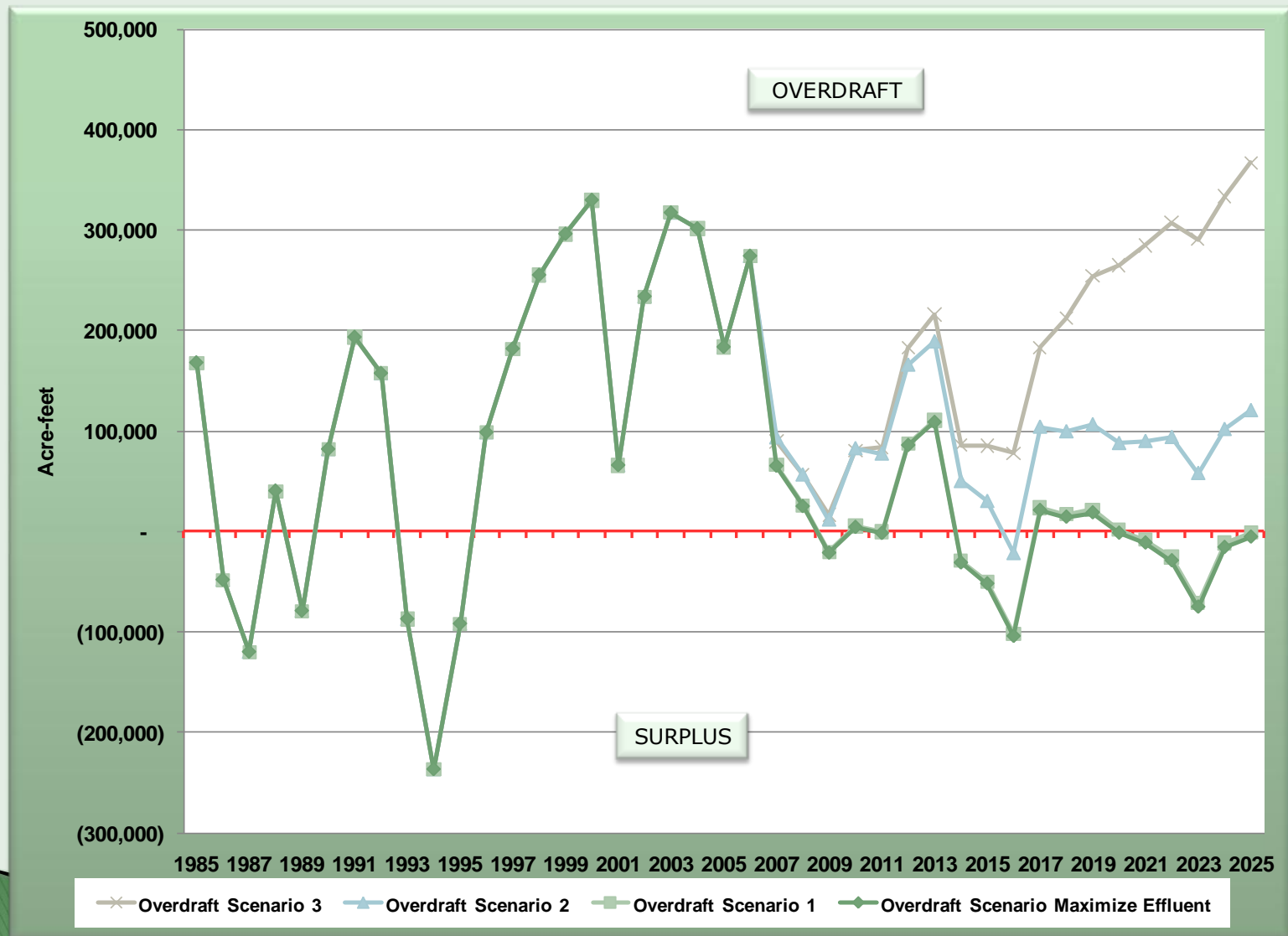


Maximized Reclaimed Use Scenario

- ▶ Developed an alternative scenario that increased the projected annual reclaimed water use in the AMA.
- ▶ Specifically, this scenario was developed to analyze the effect of maximizing annual reclaimed water use.

Projected Overdraft – 2025

Maximized Reclaimed Water Scenario vs. Baseline Projections



Results of the Maximized Reclaimed Water Scenario indicate:

- ▶ Agriculture remains the dominant a sector in Pinal AMA, and
- ▶ Even with significant projected population growth, only a small amount of additional reclaimed water is generated under Baseline Scenario One assumptions, and
- ▶ When that additional reclaimed water is put to direct use, overdraft is not reduced significantly in the Maximized Reclaimed Water Scenario.

Next Steps

- ▶ Pinal, Phoenix, Tucson, and Prescott AMA Assessments are now online
www.azwater.gov Under “Water Management/Assessments”
- ▶ Finalize the Santa Cruz Assessment
- ▶ Update templates and budgets to include 2007–2010
- ▶ Development of Fourth Management Plan (4MP)

4MP – What Should it look like?

- ▶ ADWR will approach the 4MP more as a Plan for success than a document that simply identifies the statutory requirements for the main water using sectors
- ▶ It will try to address:
 - The role of Conservation in water management
 - Implications of not achieving the AMA goal
 - Consideration of different approaches in AMAs
 - Current limitations of Management Plans
 - Recognizing sub-area issues within AMAs
 - Development of a long-term management strategy

Questions